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A BIOGRAPHY OF WILLIAM HARVEY.

Masters of Medicine. William Harvey. By D'Arcy Power, F.S.A., F.R.C.S. Edited by Ernest Hart, D.C.L. Crown 8vo Pp. xi + 296. (London: T Fisher Unwin, 1897.)

THERE is probably no name in the roll of European physicians antecedent to our own time so familiarly known as that of the discoverer of the circulation of the blood. Harvey was one of the founders of the modern method of investigating nature, and he takes rank with Galileo and Descartes among the select few who stand out as landmarks in the early history of exact science. His life and work have therefore an enduring interest for all educated men. Dr. Willis's classical biography of Harvey, published twenty years ago, was not cast in a popular mould, and is now almost out of print. It was therefore time, and there was room, for a new life of Harvey; and the late Mr. Hart was fortunate in his selection of Mr. D'Arcy Power for this task. Mr. Power tells us in his preface:

> "It is not possible, nor have I attempted, in this account of Harvey, to add much that is new. My endeavour has been to give a picture of the man and to explain in his own words, for they are always simple, racy, and untechnical, the discovery which has placed him in the forefront of the Masters of Medicine."

Notwithstanding this modest disclaimer, Mr. Power has succeeded in collecting a good deal of fresh collateral information which throws much interesting side light on the career and surroundings of Harvey.

William Harvey was born in Folkestone in 1578. He was the eldest son of an opulent Kentish yeoman, and his career was never hampered by pecuniary difficulties. His school-boy days were passed at Canterbury. Thence he migrated to Caius College, Cambridge, where he graduated in arts in 1597, at the age of nineteen. There were at that time no organised Schools of Medicine in Britain, and Harvey had to look elsewhere for the means of prosecuting his medical education. He chose Padua; and became a pupil of Fabricius—the foremost anatomist of his day. Fabricius was then engaged in perfecting his discovery, or rather re-discovery, of the valves of the veins. Fabricius, no doubt, demonstrated the existence of these valves to his class; and it may be inferred that Harvey's interest in the motions of the heart and blood was first awakened by these demonstrations. Fabricius taught that the purpose of these valves was to prevent over-distension of the vessels when the blood passed from the larger into the smaller veins (a double error), whilst they were not needed in the arteries because the blood was always in a state of ebb and flow. It was reserved for Harvey to point out their true use, and to indicate their importance as an anatomical proof of the circulation of the blood.

Harvey spent four years at Padua, and obtained the degree of Doctor of Medicine of that University. He then settled in London, and came rapidly to the front. At the age of twenty-nine he was elected Fellow of the College of Physicians; at thirty-one he became physician to St. Bartholomew's Hospital; at thirty-seven he was chosen Lumleian Lecturer on Anatomy to the College of Physicians. About the same time he was appointed Physician Extraordinary to James I., and subsequently Physician in Ordinary to his successor Charles I. These latter appointments gave Harvey command of the herds of deer in the royal parks, for the purpose of the vivisections and dissections which he practised in the course of his researches on the motions of the heart and blood, and in his investigations on embryology.

Harvey delivered his first course of Lumleian Lectures in 1616. It was in these lectures that he first propounded his views on the circulation of the blood, and demonstrated the anatomical and experimental evidence on which his conclusions were based. These demonstrations were, as he tells us, annually repeated at the Lumleian Lectures for nine successive years. It was only after this long probation that Harvey ventured to give his discoveries to the world. This he did in the form of a small Latin quarto of 76 pages, entitled "Exercitatio Anatomica de motu cordis et sanguinis," published at Frankfort in 1628. This little book is in several respects a remarkable one. It constitutes the earliest record we possess of a really scientific investigation in the domain of biology based on systematic observation and experiment. Although written 270 years ago, the work is essentially modern in tone and method. It is, in fact, the precursor and prototype of the scientific "monograph" of our own day, and stands favourable comparison with the best master-pieces of recent times. In this treatise Harvey established absolutely the fact of the circulation of the blood, and the fact that the heart was the propulsive agent in the movement. But he was unable, from his want of a microscope, to indicate the precise path along which the blood travelled from the terminal arteries to the commencing veins. He erroneously conjectured that the blood percolated the organs and tissues as water percolates the earth and produces springs and rivulets. In less than two years after Harvey's death the improvements in the microscope enabled Malpighi and Leeuenhoek to demonstrate the completion of the circuit of the blood through the capillaries in the web of the frog's foot.

After the publication of his treatise on the circulation, Harvey seems to have concentrated himself, as regards physiological work, on his investigations concerning the generation of animals. He gradually accumulated an immense amount of information on this subject, which was eventually collected together and printed, towards the close of Harvey's life, in a separate volume, under the supervision of his friend Sir George Ent, with the title of "Exercitationes de Generatione Animalium." This book, though many times larger than the treatise on the motions of the heart and blood, is incomparably less satisfying. To the modern reader the reason of this shortcoming is plain enough; Harvey was stopped at every critical point by his want of a larger magnifying power. He had at his disposal only a pocket lens, which magnified perhaps four diameters. He knew nothing, and could know nothing, of the cellular elements of the ovum, nor of the motile filaments which constitute the essence of the spermatic fluid.

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The later years of Harvey's life were passed in peaceful retirement. The civil troubles of the time had broken up his household and scattered his patients, but had left his private fortune unimpaired. At the age of sixty-eight he relinquished his appointments and practice, and went to reside with one or other of his brothers, who were wealthy London merchants. He still continued the studies he loved so well—for he had an enduring passion for original research—and maintained his interest in the College of Physicians, to which he was a large benefactor.

Sir George Ent gives us a touching glimpse of him as he appeared in his seventy-third year at the house of his brother Daniel, at Combe.

> "I found him, Democritus like, busy with the study of natural things, his countenance cheerful, his mind serene, embracing all within its sphere. I forthwith saluted him and asked if all were well with him? 'How can it,' said he, 'whilst the Commonwealth is full of distraction and I myself am still in the open sea? And truly did I not find solace in my studies and a balm for my spirit in the memory of my observations of former years, I should feel little desire for longer life. But so it has been, that this life of obscurity, this vacation from public business, which causes tedium and disgust to so many, has proved a sovereign remedy to me.'"

Harvey had the satisfaction of living to see his great discovery generally accepted as true. In his old age he was known and honoured throughout the learned world. The College of Physicians erected a statue in his honour. In his seventy-sixth year he was elected president of the College, but declined the honour on the plea of the infirmities of age. Harvey made a peaceful ending in his seventy-ninth year, and was buried in what is now called the "Harvey Chapel" in the parish church of Hempstead in Essex.

Mr. Power has produced a work of permanent value, which is not likely to be superseded. The book is invitingly got up, and is eminently readable. It should attract a large circle of readers both inside and outside the professional pale. W. R.

THE NOTIONS OF CLASSICAL WRITERS ON GEOGRAPHY.

A History of Ancient Geography. By H. F. Tozer. Pp. xvii + 387. (Cambridge University Press, 1897.)

THE want of a short, popular history of classical geography is one which has been long felt, and there is no doubt that the little volume before us will help to fill it. The great work by the late Sir Henry Bunbury, from which Mr. Tozer has so largely drawn, is hardly fitted for a text-book, even for advanced students, for the subject of ancient geography is treated therein in such an exhaustive manner, that no ordinary student who has other subjects to master can ever hope to have sufficient time to study it in the way in which it should be studied. It is somewhat a matter of doubt if Mr. Tozer's, with its three hundred and seventy pages of closely-printed matter, is not too long when the absolute needs of the student are taken into consideration; still the reader will soon see how to pick out the important facts from this pleasantly written treatise, and how to let alone the generalisations and discussions of theories which though interesting enough are not essentials.

The first thing that strikes the reader is the fact that Mr. Tozer has described his work inaccurately; it is not a "History of Ancient Geography," but a "History of Ancient Classical Geography." In days gone by when Oriental studies had not attracted the attention of workers, and the works of Greek and Latin writers were believed to contain all the history of the nations that are past and gone, the title which Mr. Tozer has given to the work would have been well enough; in these days, however, it is misleading. On p. 3 Mr. Tozer says:

> "The natural starting-point for such a history must be the shores of the Mediterranean, because the peoples that dwelt in the neighbourhood of that sea first cultivated the science of geography on an extended scale, and it was from that quarter that the information was originally derived which furnished the material for such a study."

Very true as far as it goes, but Egypt and Syria both form part of the Mediterranean coast on the south and east, and yet Mr. Tozer's book tells us next to nothing about either, although so much is now known of both countries, and of the ancient intercourse which existed between them in very old times. Hieroglyphic inscriptions are extant which describe military and other expeditions to the heart of Africa and to the coasts of Arabia from the period of the sixth to the eighteenth dynasty, and several long historical texts which describe the progress of Egyptian arms in Western Asia are so well known as to make it difficult to see why Mr. Tozer has not made use of them. The Tell el-Amarna tablets, which have now been translated into English, French, and German, form a most valuable mine of information for the student of ancient geography, and yet they are not mentioned in Mr. Tozer's work. It is not yet possible to identify all the places the names of which are given in these remarkable documents, but it is quite easy to sketch the main trade and military routes between Egypt and Northern Syria, Western Mesopotamia, &c. About the fifteenth century before our era a certain Egyptian gentleman set out on a journey to Syria and, fortunately for us, he wrote an account of his experience to a friend wherein he detailed the events of the way, the names of the places at which he stayed, and several matters of considerable interest to the geographical student. M. Chabas' edition of the text and translation have been so long before the public that the Mohar's "itinerary" might well have been described by Mr. Tozer. Passing from Egypt to Babylonia and Assyria we think that enough of the early geography of these countries might have been gleaned from the cuneiform inscriptions to make two valuable chapters at least, as well as a tolerably full map.

Speaking of the pygmies (p. 30), Mr. Tozer says:

> "We may conclude therefore that the Pygmies of Homer were a real people. . . . The Egyptians might easily have heard of them, and through them the story might have found its way into Greece."

A little searching of Egyptian records would have shown him that the Egyptians knew a great deal about the pygmies, and that King Assa, about B.C. 3300, kept

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